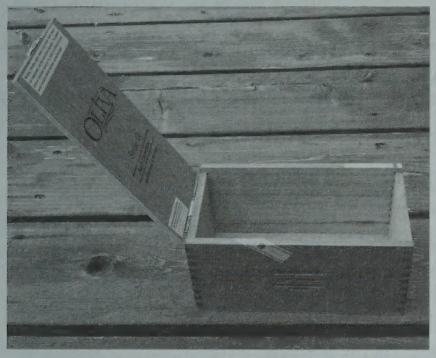
XTAL SET SOCIETY
Books, Kits, Parts

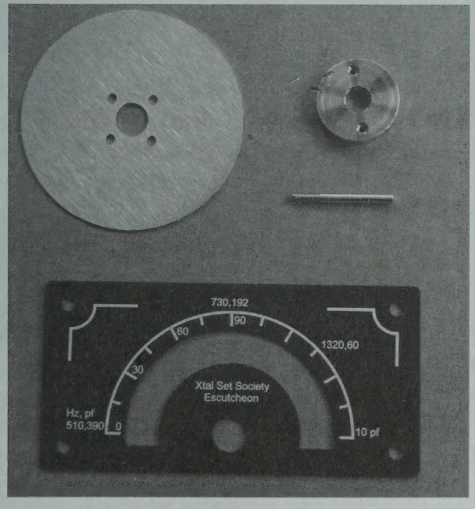
YOUR MARCH 2015 NEWSLETTER IS ENCLOSED

GETTING BACK TO BASICS

FIND US ON FACEBOOK
XTALSETSOCIETY

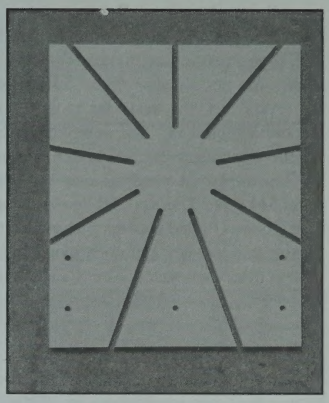


Cigar Box $5.95



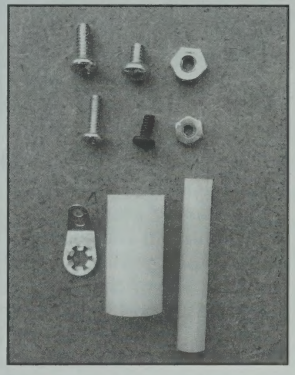
Round Dial Plate $2.95
Dial Coupler $8.95/Pointer $2.95
Dial Front Panel $8.95

Spider Coil Form



This 5 by 6 by 1/8th inch ABS plastic form includes nine NC punched radial slots and five mounting holes. The inner diameter is 1.6 inches and the outer diameter extends to the edge of the form, 5.0 inches. This size supports 250 uH coils (good for the AM band) when used with #22 or #26 enamel, or 150/45 Litz wire using 56 turns of 150/45 Litz, with a 1.6 inner diameter and 4.2 outer diameter. Weight of the form itself is 2 oz. An instruction sheet including formula and table ships with the form. In addition, you'll find the spider formulas for number of turns for a given inductance on our formulas-calculators web page on our main site, www.midnightscience.com #22 and #26 enamel coated wire and 150/46 Litz wire are also listed on our parts page on the web. Spider Coil Form Cat #SpCO $9.95 each.

Connector Assortment



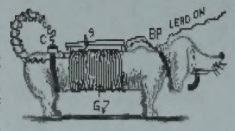
The assortment includes:
6, 6-32x3/8 inch Phillips-head screws,
6, 6-32x1/4 inch Phillips-head screws,
12, 6-32 hex nuts for the above,
6, 4-40x3/8 inch Phillips-head screws,
6, 4-40x1/4 inch Phillips-head screws,
12, 4-40 hex nuts for the above,
6, #6 solder lugs,
2, 1-inch by ½ nylon shafts with interior ¼ inch opening,
2, 1.5-inch by ¼ nylon shafts.

You can use a screw, solder lug, and hex nut to provide a ground connection on the frame and rotor plates of our air variable capacitors. You can use a pair of the nylon shafts by drilling and tapping two holes in the larger shaft for interconnection with the cap shaft and the smaller nylon extender. This enables you to mount the cap away from the front panel.

Cat# Connect assort 3.95

Xtal Set Society ◆ PO Box 3636, Lawrence KS 66046 ◆ 405-517-7347 ◆ xtalset@sunflower.com
WWW.midnightscience.com

THE XTAL SET SOCIETY



e-mail: xtalset@sunflower.com

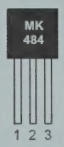
We are dedicated to once again building and experimenting with radio electronics, often—but not always—through the use of the crystal set, the basis for most modern day radio apparatus. This newsletter helps support our goal of producing excellent quality technical books that encourage learning and building. To join the society and receive one year of the bi-monthly newsletter, remit $14.95 to The Xtal Set Society. Canadians, please remit US $15.95. Outside the US and Canada please remit US $21.95.

Please send articles and correspondence to the address below. NOTE: Unless otherwise stated, The Society assumes that the material you supply is fit for print (free of copyright or other infringements) and that by your submittal you have given us your permission to print the material without restriction.

Founder &Columnist– Philip N. Anderson, WØXI
Editor & Queen Mum- Patricia, NØGZZ
Columnist- J.K. Fenton
Columnist- Dan Petersen, W7OIL

MK-484 TRF AM Radio Chip in TO-92 Pack

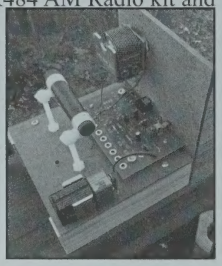
The MK484 is an offshoot of the famous Ferranti ZN-414 and is a tuned radio frequency (TRF) radio in a small TO-92 transistor-like package. Combined with (these parts not included) three resistors, three capacitors, an ear phone, 1.5V battery, tuning coil and tuning capacitor, you can make an AM receiver for the AM band and up to 3 MHz. See our article in the July issue of our newsletter for a circuit example with details. Suggested schematic with parts list sent with each IC (chip). Cat# XSMK $2.49



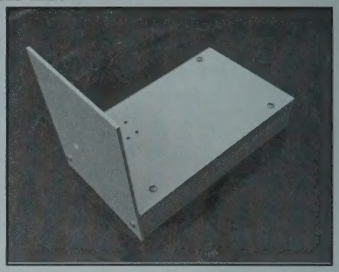
Mini MK484 Radio Kit

No antenna or ground required!

This "mini" kit is a subset of the MK484 AM Radio kit and uses a small portion of the printed circuit board of that kit. The MINI features the MK484 IC, a ferrite rod antenna, a 1.5 volt regulator, a handful of resistors and capacitors, an on-off switch, variable capacitor, panel, chassis, and crystal radio earpiece. The set does not need an antenna or ground since it includes the ferrite rod; does not need a volume control since it has built in gain control, and the earpiece takes the place of headphones. You supply the 9V battery. The radio is set to tune the AM band. MK484 mini $69.95



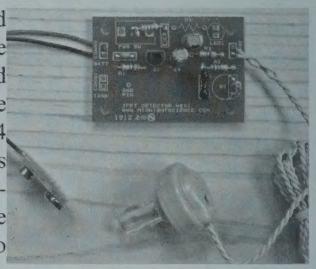
ABS Panel and Chassis Kit



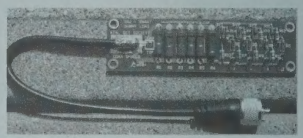
This kit, includes two precut ABS (low-loss) panels, 5 x 6 x 1/8 and 5 x 8 x 1/8th inches; two wood rails each 1.5 by ¾ by 8 inches long, and six wood screws. No holes are predrilled in the panels or rails. The kit includes mechanical drawings showing dimensions and locations for the holes, including drill-hole patterns for the shaft and mounting of our 365 air variable capacitors. ABS Panel Assembly Kit, Cat #ABSPAK, $9.95.

5x6x1/8 ABS Panel, Cat#ABS6 $ 3.95
5x8x1/8 ABS Panel, Cat#ABS8 $ 3.95

Infinite Impedance Detector Kit



This kit includes parts and a small PCB to substitute a JFET circuit configured as an infinite impedance detector for the usual 1N34 diode detector. With this replacement, your crystal set will generate more volume and reduce audio distortion. Historically this arrangement was used with a triode tube in early AM radio sets. Ideal for those wishing to listen to AM with improved audio linearity. Kit replaces the diode detector in your crystal or TRF set. Assembly time is about one-half hour. CAT # XSIDK $19.95.



XS-SDLK (Self Powered) Smart Dummary Load- 10 Watts.

For QRP Amateur Radio use. This kit and our passive CW filter kit were inspired by our enthusiasm for non-powered - no batteries - electronics. The "smart" dummy load, assembled on a 1-1/4 by 4-1/2 inch PCB, features a 10-watt dummy load with power levels achieved denoted by four LEDs. The circuit includes six 3-watt metal film resistors, four detector diodes, four zeners, four LEDs, and bias resistors. The four LED circuits denote power achieved: 1, 2, 5, or 10-watts. *The signal measured supplies the power*. No batteries Mom! Assembly time is about 25 minutes. Coax with PL-259 connector not included. XS-SDLK , $19.95.

The Xtal Set Society Newsletter

Volumn 25, No.1 March 2015

In this issue (#142) March 2015)

* Bill Holly Cigar Box Radio
* Larry Jeffers Cigar Box Radio
* Chip Olheiser Cigar Box Radio
* Anthony Dunn Cigar Box
* Using A Transistor to Boost Gain
* Xtal Corner: Member Correspondence

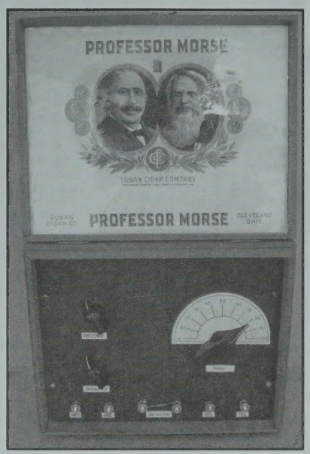
Message from the Queen

A big thank-you to all those who submitted radio plans. While I proposed a contest for building a radio in a cigar box, I was by no means advocating smoking all those cigars. It was just a nostalgic moment thinking back to earlier times when a cigar box given to me by my grandfather was for keeping treasures like the penny he gave me.

In more recent times, Phil found a source for very nice wooden cigar boxes so it seemed a good ideas to get folks building in them.

Many of our members submitted pictures and ideas meeting my criteria of looks/creativity, design, documentation, number of parts. In fact, I have had a very difficult time in choosing the winners. Four are published in this issue. Others will be published throughout the year.

Bill Holly
Most creative with the box



Hi, Here's my entry for the cigar box xtal set contest. The circuit is from "50 Tested Wireless Circuits" Edited by F.J. Camm circa 1930. I omitted the switchable loading coil he showed in the circuit but otherwise it's the same. The circuit is similar to Alan Klase's "Pretty Good Xtal Set" shown on his website. The circuit is very sensitive and by adjusting the detector and antenna feed points you can achieve a fair amount of selectivity but if you are in a crowed RF environment you would benefit from the use of one or more traps. This circuit would probably be much more satisfactory in a more rural location. Hi Q parts and wire probably would have helped considerably. I used ten taps and the top tap switch is the antenna and the bottom switch is for the detector. The capacitor is an el cheepo slf variable of about 400pf. The coil is #22 awg solid plastic insulated wire wound in a one over one under pattern on a five in. diameter form made with 3/4 inch plywood and 20 penny nails. All crosses are held with hot melt glue. The coil is 249 mh. The "Professor Morse" label is a scanned copy of my original printed on sticky back label and covered with a plastic laminate sheet. Made it hard to get a good photo without a glare spot. The overall size of the box is 7 1/4 inch by 9 1/8 inch by 3 1/8 inch deep and the interior is 6 1/8 inch by 8 1/2 inch by 2 1/2 inch deep. The front panel is 3/16 micarta that I sanded down with a palm sander to get a mat finish and is mounted on two pieces of 1/2 inch thick pine. It slides into the box with a snug fit but is easily removeable for service or exhibition. With the lid closed there's about a sheet

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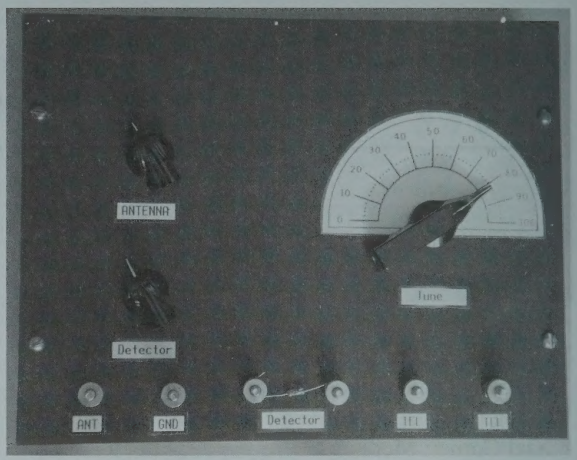
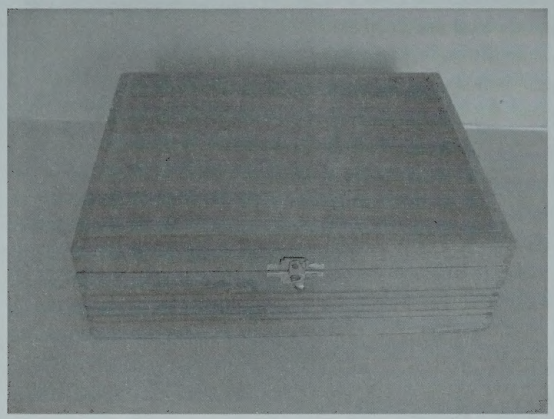
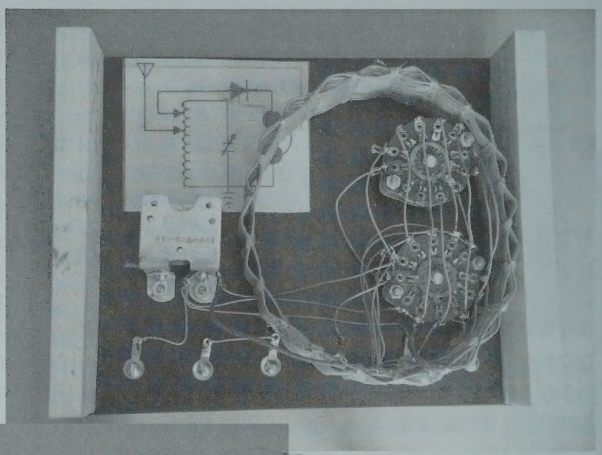
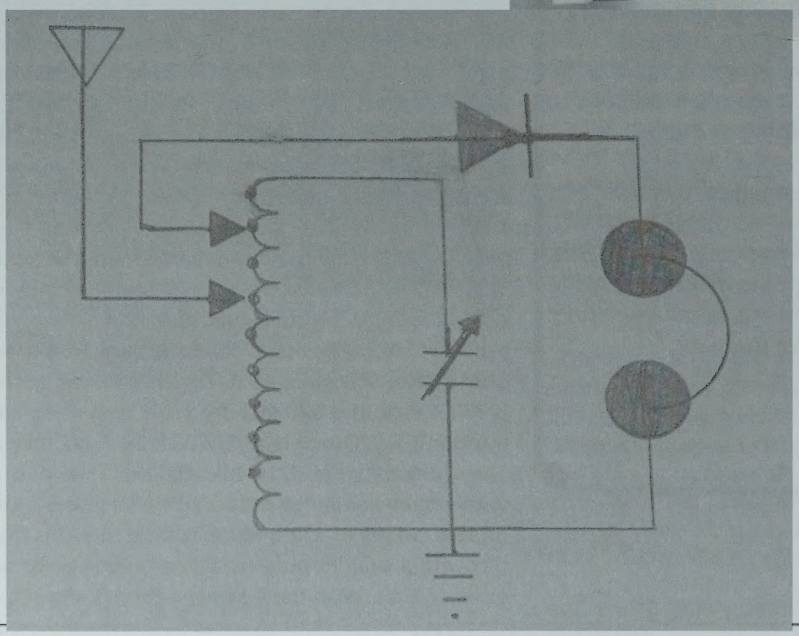
of paper thickness over the knobs so the set doesn't rattle or "bang" around when moving it about. The box originally held fifty "House of Windsor" cigars made in Windsor, PA. I Thought the "Professor Morse" label would be more appropriate for a cigar box radio and it was a perfect









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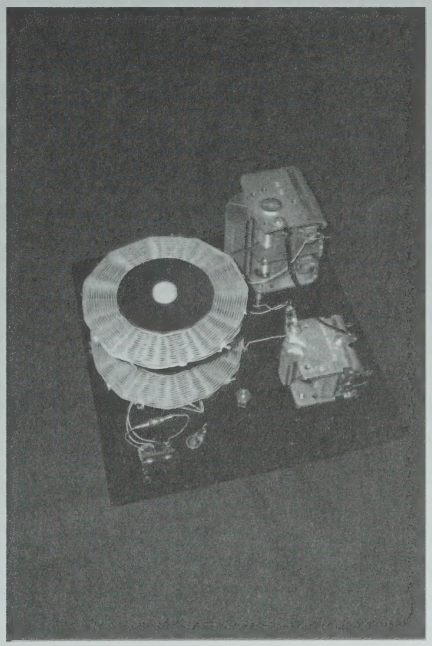
Larry Jeffers
Most complex Design

The society asked for Crystal sets built in cigar boxes. I went looking and came up with a nice box. Now the fun begins! How to fill it with a set that looks great and also has good performance.

I had two nice vernier capacitors and Litz wire, so now the fun starts.

The box has a flush lid, so it would need a recessed panel. After a few measurements and a couple days of thinking, I got started. First some rails to mount the panel at a depth that would leave clearance for the knobs and dials were glued in place and a panel was cut to fit. Then some brass parts were made including hubs to put the dials on capacitors, end fed, binding posts and pointer markers for the dials. Then the coil mounting and coils were made and everything mounted and wired.



This set performs beautifully! I get 10 daytime stations which is great for my area. We have one local station at 5 miles and one at 45 miles. All others are 60- 180 miles away. At night it really comes to life. It is selective and loud. The dials track well, peaking within 1 or 2 points. The antenna section is fairly broad tuning and may not need a vernier. The detector section tunes very sharp.

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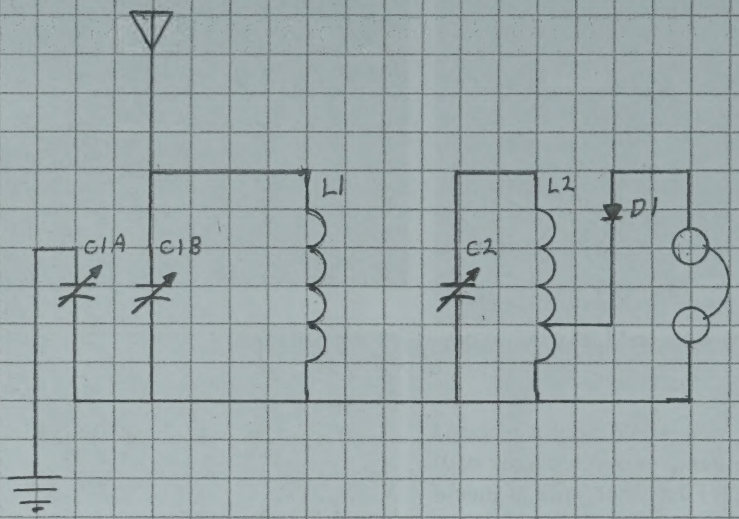

C1 - 2 GANG VERNIER CAP.
C2 - SINGLE GANG VERNIER CAP.
D1 - ANY GOOD GERMANIUM DIODE
L1 - 54 TURNS 165/46 LITZ
L2 - 54 TURNS 165/46 LITZ
TAPPED 20 TURNS FROM START

COILS WOUND DUOLATERAL ON
2" 11 SPOKE MANDREL
3/16" SPOKES - SEE PICTURES
ALL CROSSOVERS TIED WITH
DENTAL FLOSS BEFORE REMOVING
FROM FORM THEN SPRAYED
WITH CLEAR LAQUER

THIS BOX MEASURES 6½" X 6⅜" X 4"

COILS ARE SPACED 1¾" CENTERS
ON COIL MOUNT

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Chip Olheiser
Most complete Documentation

I saw the November Newsletter and the contest announcement. This was a challenge because as simple as some crystal sets are, it can be difficult to package them in a given, defined footprint.

My style of building homebrew is to provide enough documentation to be able to repair it later; usually a schematic and parts list is all that's required. But this contest has the requirement of bounding the physical dimensions inside a box - or it could have been built outside the box on its outer surfaces but that just didn't seem right to me - and providing documentation sufficient to "show it off".

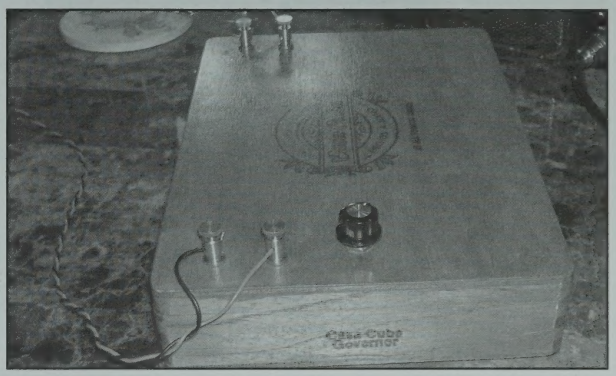
My original design starts with a schematic draft, then a working breadboard prototype; this process may be repeated multiple times. Then I work to finalize the design down to an acceptable final parts list and schematic. The parts list step is absolutely critical because I don't know what to buy to build the working unit until I know what parts I need to purchase. Procurement of deliverable hardware parts is thus held up until the prototype design is completely working and meeting all design requirements.

Part of this process is to "Muntzify" the design. "Muntzification" comes from the TV set manufacturer Earl William "Madman" Muntz. What he'd do is take a TV set design and start pulling parts out until the TV set stopped working, put that last part back in and then sell that design in his TV set manufacturing factories - cheap! Cheap because he got all the excessive cost out by pulling parts!

I did the same thing. My original design had all sorts of circuits including Shocktty Barrier Diode detector, LITZ wire coils, built in audio amplifier, speaker and a internal battery pack.

But then the issue of the Cigar Box popped up. I'd found a beautiful, old Cigar Box that I'd bought back in 1977 but the design had too many parts to fit in the box! Besides, that box has a history! More on that in a minute. But the Cigar Box was available. But how to fit my design inside the box? Before I answer that, here's the brief history of that Cigar Box.

Cigar box history: I bought the Cigar Box back in 1977 at Eastridge Mall in San Jose, CA. I used to smoke cigars back then. The Casa Cuba cigars were excellent, great mellow taste and smoke; I smoked them all. They were about $1.60 each - at today's prices that's probably a $6 cigar. But these were very excelled, high quality cigars.



I even took that box with me on a business trip to Atlanta Georgia (Warner Robbins Air Force Base). I'd smoke a cigar in the evenings and my company coworker travelling companions saw the Casa Cuba label, thought that I'd flipped over to Castro Communist party! Nah, they were just joking. Anyway, very excellent cigars indeed.

The box was then storage for a DMM I'd bought at a flea market. It was storage for about 20 years. The box survived 6 or 7 moves until it ended up here in Modesto. It sat empty here for another 10 years until 2 months ago when I decided to use it for this competition. So now its turned into a Crystal Radio Set! What a history.

Needless to say, the biased Shocktty Diodes, built in audio amplifier, speaker, and battery pack all were removed. The coil still was a major issue. To lay flat, I chose a Spider coil form. Coils L1 and L2 were designed using 150/46/ served LITZ wire and RF swept bench tested for maximum tuning range, the target being 540 to 1705 kHz. Also, tried for maximum detector voltage output and minimum MDS (minimum discernable signal). I also tested for 1N34A detector damage as

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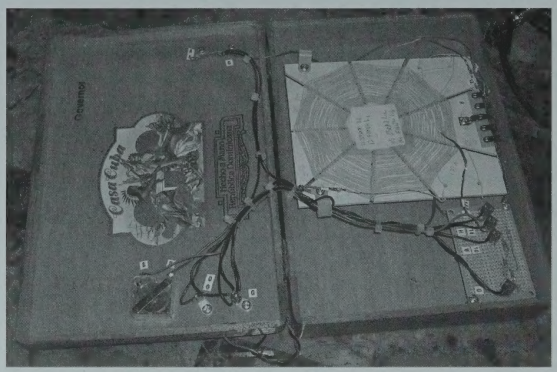
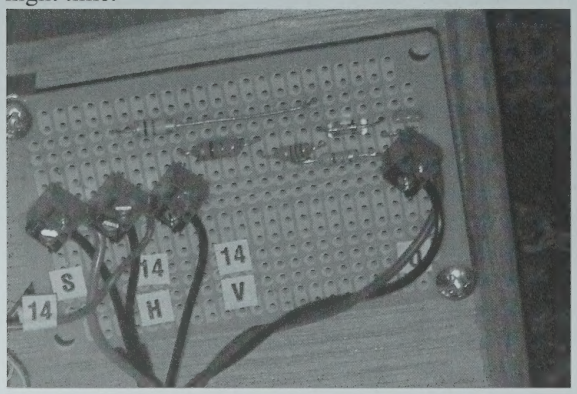
I have some nearby high power amateur transmitters and antennas in close proximity to my SWL crystal set antennas. All passed.



The one big problem though, is tuning band rejection or the ability to pull weak stations out near the local "Flame Thrower" 50,000 watt local stations. Modesto is blessed with 2 of these Flame Throwers. No matter what I tired with coil "Q", capacitor "Q", and RF grounding, I cannot successfully reject 100% of these Flame Thrower signals all of the time. What saves me is at night, these stations are required by FCC to lower the power from 50,000 watts to 4,100 watts in one case and 4,000 watts to 950 watts in the second case. The third switches antenna pattern so its lobes switch at night time.



Note that my design has user selectable inductance "Tweak" taps. This is to allow for variation of capacitive reactance of the antennas - user selects tap for best performance with his antenna. That way, tuning range is basically preserved as well as MDS.

I had fun testing this set as I used swept RF testing techniques to see the actual frequency response of the tuned circuits over the entire band. I rarely get the opportunity to sweep design circuits and this set was perfect for that kind of real time testing and tweaking. I was able to get things just right.

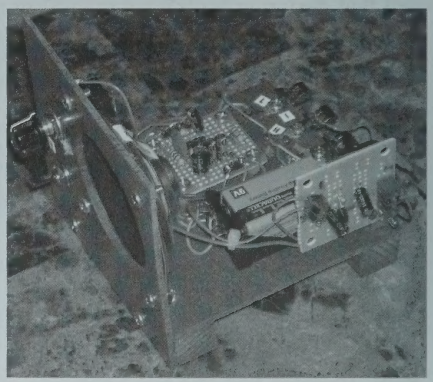
By the way, measured performance is MDS -37 dbm, tuning range of 495 to 1470 kHz, 3 db stop band tuning bandwidth is 116 kHz, and a typical output voltage preamplification of 108 MVPP. The 1N34A was successfully tested to burnout level of 20 volts Vr. I did not test 1N34A If burnout as its 500 milliamps and I have no signals that would drive the diode that hard, so the test is unnecessary.

The capacitor audio output terminal drives the amplifier best with gain set to 18,000X, though the "Flame Thrower" stations will drive the audio amplifier at gain set to 200X.

Addendum:

I measured the Peebles PO-386 with mods using precision step attenuators, Spectrum Analyzer and Tracking Generator. I swept from 10 kHz to 30 kHz. This produced the following gains: PO-386 has a gain of 47 db on the high setting. Its gain on low setting is only 8 db.

The combined Cigar Crystal set, and now the PO-386 gain set to HIGH, produces a new MDS of about -82 dbm or a S7 signal. The combined total, end to end of the entire set, will detect AM stations to -82 dbm or about S7 level signals.



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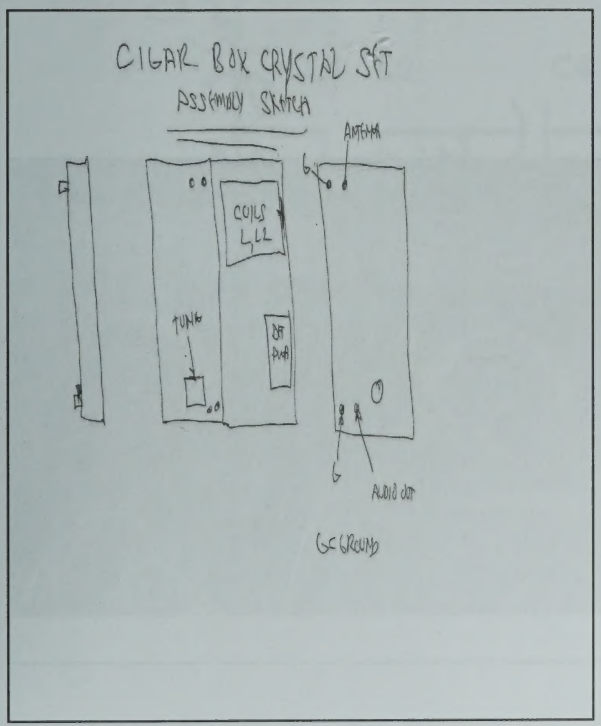
This explains its ability to pick up weak, distant DX stations at night.

Anyway I had fun building this project and even more fun measuring and characterizing the set using modern test equipment and test techniques. It explains exactly what is going on and what to expect. A very fun, enjoyable project indeed.



TOP ASSEMBLY
LONG WIRE ANTENNA
CIGAR BOX CRYSTAL SET
PEEBLES AUDIO AMPLIFIER
TWISTED PAIR WIRE 6 FEET

SUBASSEMBLIES, A2
COIL SUBASSEMBLY L1, L2
COIL FORM, SPIDER COIL XTAL SET SOCIETY
LITZ WIRE, 100 FOOT ROLL XTAL SET SOCIETY

DIODE DETECTOR SUBASSEMBLY
0.1 UF CAP 50 V C2
1N34A DIODE D1
47 K OHM, 1/4 WATT CARBON RESISTOR
INDUCTOR, 33 UH L4
INDUCTOR, 82 UH L3
INDUCTOR, 47 UH L5
RADIO SHACK PWB A9
TERMINALS, SCREW

SUBASSEMBLY CIGAR BOX

BINDER POST 4
CASA CUBA CIGAR BOX, 7X10X2
CLEAR VARNISH PAINT
HOOK UP WIRE STRANDED 26 AWG, WHITE
MISC. HARDWARE, STANDOFFS
RUBBER FEET 4
TUNING CAPACITOR PEEBLES PHILMORE 1951

SUBASSEMBLY TWISTED PAIR WIRES
TWISTED PAIR WIRE 6 FEET 2A 4

USER PROVIDED ANTENNA, AUDIO AMPLIFIER

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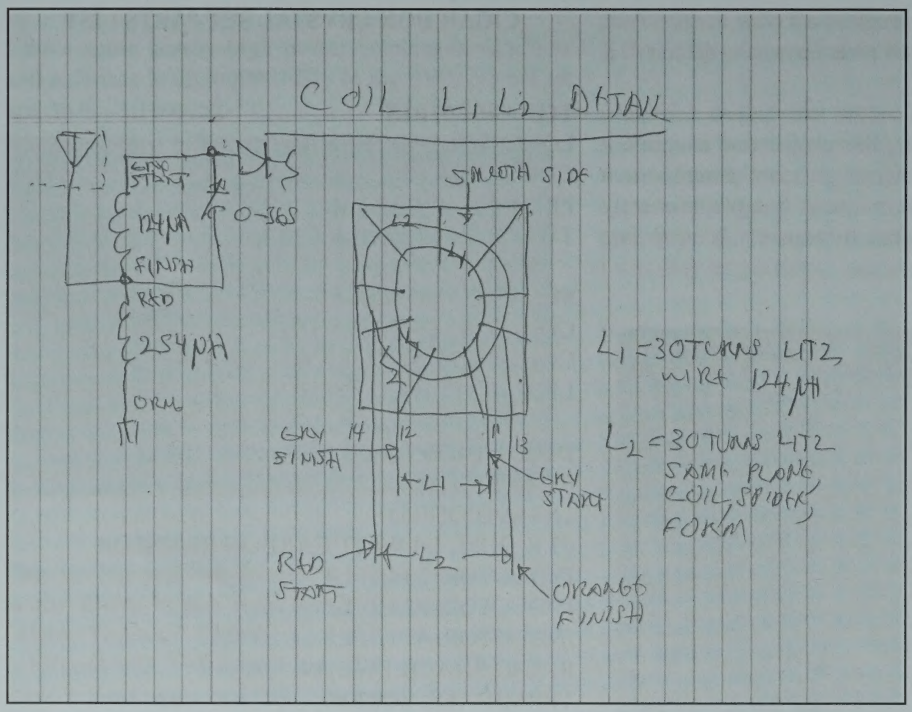
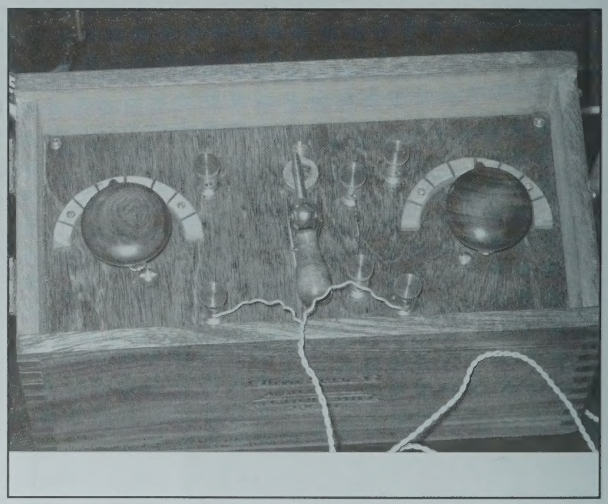


Editor: Chip sent many more graphs and charts showing his measurements. Lots of really good detail.

Anthony L Dunn
Use of the catwhisker



My finished entry for the Cigar Box Radio contest is a double-tuned, mutually resonant circuit, with an extra variable capacitor for antenna tuning. I have it set up to work with either a catwhisker detector or a diode, depending on my mood. The box you sent was so nice I decided not to drill any holes in it, but instead built my radio on a piece of ash plywood stained to match the box and mounted on four corner blocks glued inside my box. My variable capacitors are mounted on two homemade copper spacer plates, with extensions to reach my antenna and ground binding posts. The knobs are actually wooden drawer pulls, stained and fitted with brass set-screws. My dials are cut out of the same plywood as the chassis board. There is an extra 220pf

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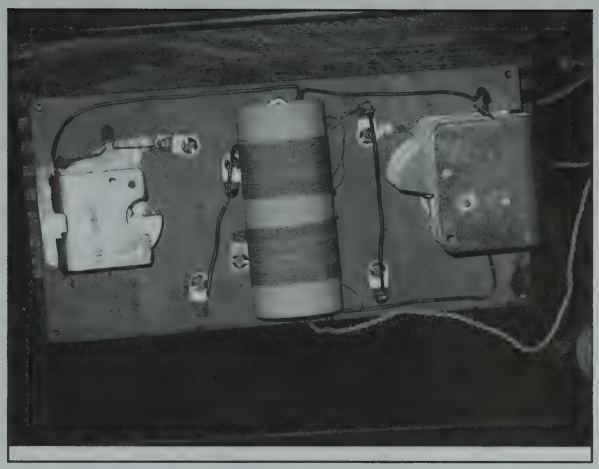
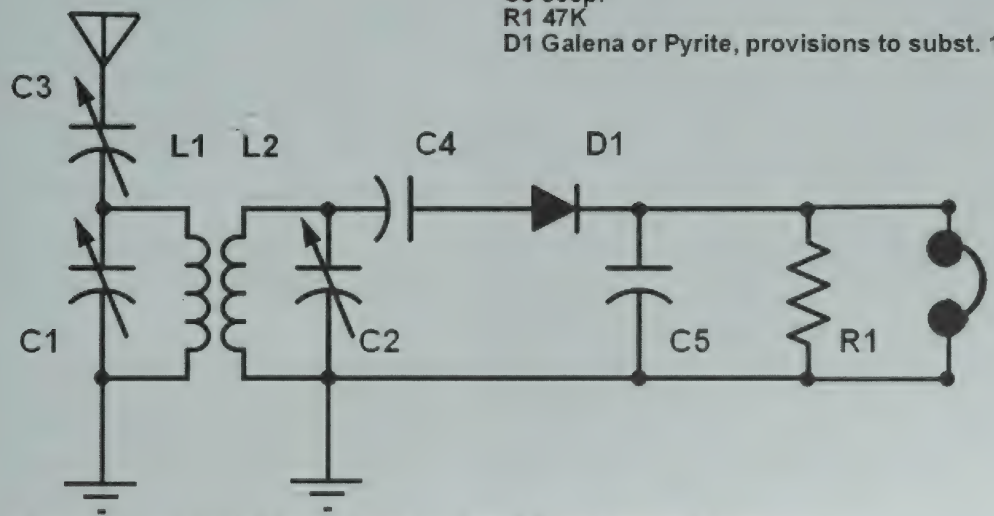
capacitor not shown on the schematic, which is across the antenna tuning cap to give the desired range.

I'm having a ball playing with this, now that it's complete. It is very selective and fairly sensitive (with 75 feet of antenna) and I can get 8 stations at night with it. I guess I'm hooked on the Xtal radio hobby!



Anthony's Xtal Set

C1, C2, C3, 365pf air variable
C1 & C2 ganged
C4 100pf
C5 500pf
R1 47K
D1 Galena or Pyrite, provisions to subst. 1n34a



L1, L2 are both 62 turns 20/44 Litz on 1-1/4 pvc form. Contra-wound, in phase.
Will probably try Bogen T725 in place of R1.

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Using A Transistor To Boost Crystal Set Gain/ output

By Phil, WØXI.

Carl, from Connecticut, sent me a scan of a page about an old article in Electronics Digest titled "Gernsback Interflex Receiver." His interest is in using a transistor to boost the gain of a crystal set. The article page included both transistor and tube version schematics.

I've redrawn the transistor version, which is shown in Figure 2, using my circuit simulation program from LT Spice. However, to check out the circuit, I also pulled up a previous circuit, shown in Figure 1 that verifies/ shows how the basic diode detector crystal set works. Let's examine that circuit first.

The generator shown in figure 1 as V1, simulates the voltage generated by the tuning coil in an actual circuit. I used a 1N914 diode here since I don't have a model in the program for the usual 1N34 germanium. However, that doesn't matter since we are not trying to optimize the circuit, just see how it works. R2 represents the hi-z headphones and C1 shows the usual RF bypass capacitor.

I set the program to generate a 50 microsecond burst of a 1 MHz carrier; that signal is shown in the graph above the circuit. Note that the voltage at the output of the diode, across R2, immediately drops to about -4 volts as the signal is applied, as expected. Then, when the pulse of RF energy stops, the diode no longer conducts and the charge dissipates from C1 to R2 at the output, thus following roughly the input signal. That's what a crystal set does.

Now let's look at Figure 2, which shows the simulation when the transistor, a 2N2907, is added to the circuit along with the needed battery.

Note that the positive side of the battery is tied to ground along with the emitter of the PNP transistor. That forces the DC voltage at the collector to be -3 volts. Now let's see what happens as the radio frequency voltage is applied to the circuit. As the signal voltage swings negative, that forward biases the transistor and diode and current flows through the transistor from emitter to collector. That Current also flows through R2, our simulated headphones and then returns to the battery. Note in the signal plot at the top of the figure

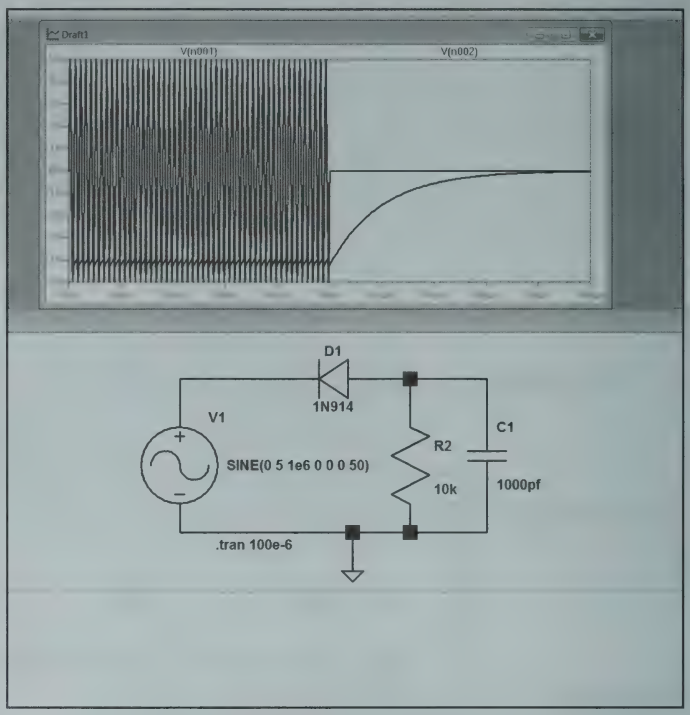

Figure 1

that the voltage at the collector started at -3 VDC (at the far left) and then jumps up to 0 and that after the radio signal was removed (at the middle of the graph) the output voltage slowly drops back to its starting voltage of -3 volts. That would indicate that the output of the circuit is a replica of the peak value of the signal voltage. Houston, "we have lift off." The circuit seems to be working.

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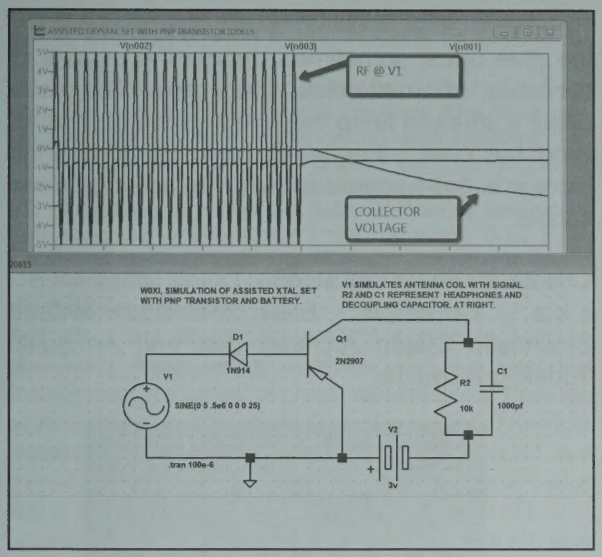
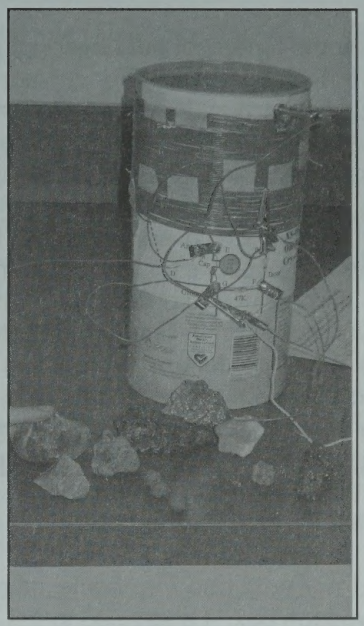


Figure 2



I've not wired up a set on the bench and run this circuit for real. I'll try to find the time to do that before the next newsletter deadline. If you try this circuit too, let us know how you did. Note that we did not try to optimize the above circuit; we just wanted to verify that it works about the same as the diode only circuit.

Xtal Corner; Member Correspondence

[Editor: I never get tired of seeing kids learn about radio and rocks!]

Hi Patricia,

Excuse the time this took, but here are 2 photos in case you'd like them.

I've just changed operating systems on my computer and am perplexed that the name of the files have reverted to how the camera called them. At any rate, the two boys are Cameron and Cody, and the photo of the oatbox shows the different rocks they tried in place of the diode. The pyrite/fool's gold worked all the times they tried it. The carborundum seemed to get a bit of static at best.

If you end up using these, the boys would love to see it in the newsletter. I'd be happy to purchase one for each of them. Many thanks, Laura

Cameron and Cody with their radio

From Ron Sindric:

Sorry if I seem to be excited about something small. But, here are some pix of my first attempt to construct a crystal radio from scratch. I worked on

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3-2-15

the detector some time ago, but never got around till now to put it all together. When it warms up it will be time to install an end-fed long wire antenna, lightning arrestor and stress relief to compensate for wind-induced wire and support tree movement. Note that I used Euro-style terminal strips to create an open design which will allow me to play with different wiring options for the radio. If I go to a carborundum crystal in the detector, I'll have to add a bias voltage. I am kicking around the idea of adding a small solderless prototyping board if I decide to play with biases, amps, etc. What might not be showing is the copper plate that runs the entire bottom of the breadboard. This plate is attached to the **GROUND** connection and serves as a **GROUND PLANE** for the radio.

I might build my next one into some other odd-yet-artistic wooden box. I also need to get MUCH better at winding coils by hand including large spiderweb detection coils and paired loose-coupled coils all in the name of making my radios more selective. Suggestions for future designs are welcome !

Noticeably absent is the tuning capacitor(*s*). I am still working on getting these.

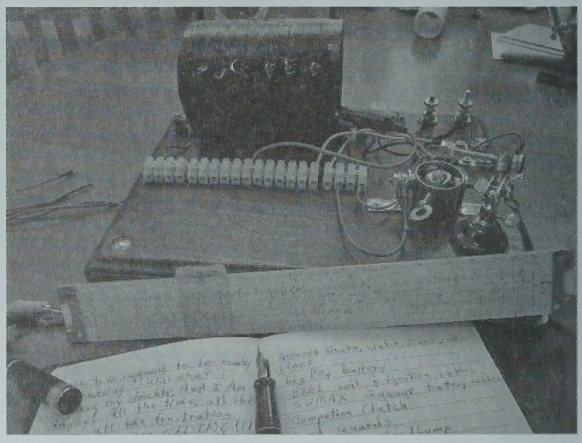
I went out and scrounged some local thrift stores and will send pix of what I found. The local hardware store was a good source too.

I am sure the ideas I am passing along below are things already known by Crystal Radio Builders. Please forgive my ramblings:

I will make my next radio ground plane from trimmed and flattened sections of Aluminum pop cans.

The paper "tubes" I sometimes use for coil forms can be a bit fragile. Before I start winding the coil, I mix water with carpenter's glue and paint it on both the inside and outside of the tube. After the glue dries, sometimes I spray the outside of the tubes with matte clear spray paint. The matte helps a small bit keep the wire in place as I hand-wind the coils. For small coils, my local thrift store is a good source for wooden sewing thread spools.

Cheers for now, Ron Sindric
a.k.a. Cornelius Blissripper-Sparrowcake Stochastic Steam Archaeologist and Armadillo Yodeling Instructor



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Detectors, Amplifiers, Headphones, and More: The Broad Reach of Crystal Radio, Volumes 14 & 15 of the Xtal Set Society Newsletter

Once again society members bring you ideas and instructions for a variety of crystal radio projects. This book contains projects and theory about crystal radio including: The Magic Reynolds Wrap Attic Antenna and instructions for building your own basket weave coil mandrel. The secret life of detectors is revealed in John Davidson's seminal article presented here with parts 1 and 2 together. 8 1/2 X 11, Comb bound. Cat # xv15 $12.95

Crystal Radio: From Galena to Litz Volumes16-17 of the Xtal Set Newsletters

Just when you thought the projects were over, here's a new batch. Again society members bring you ideas and instructions for a variety of crystal radio projects. These are gathered from the 2006 & 2007 newsletters! H.P. Friedrichs introduces his "Tea Time" Headphones (constructed in a pair of little tea boxes). There's a variable-coupled basket weave coil, Dan's Fruit of the Loom Set (a basket of Litz of course), Mike's 1-Tube Low Voltage DXer Set (3Q4), stuff about Toroids, Patron's Modern Armstrong Regen RX, stuff on detection, Spider coils from Dan, the Xtal High Voltage Contest Entry winner, a calibrated capacitor, Phil's Crazy-L Attic Antenna, Alex Jueschke's homebrew loopstick coils (from magnet ore sweepings), a rare picture of Joe Eisenberg of Nebraska (!), another regen rig, Phil's crazy AM Chopper Modulator, a sampling of member correspondence, and more! 8-1/2 by 11, 100 pages, Comb bound.Cat# XV17 $15.95

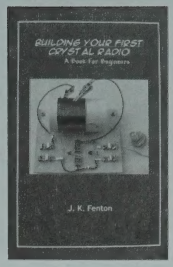
Crystal Set Society Newsletter Volume 18 and 19

Learn about using audio transformers from Phil, building a basic grid leak from Dan, and how to build a homemade flame triode from Nyle Steiner. These ideas and many others are from the 2008-2009 newsletters. In the 2009 section, you will see Dan's one-FET set, and an antenna tuner for your crystal radio. Dennis Baker shows us a radio on a stick. 8 ½ by 11 with 118 pages, Comb Bound. XV19 $16.95.

Antennas, Tubes and Regeneration, Volumes 20 and 21

This edition marks 20 years of the Crystal Set Society. Many thanks to all our members for twenty years of fun with radio. The compilation includes the articles from the 2010 and 2011 newsletters, including: Fun With Homebrew Cuprous Oxide Diodes; Resistance of Hardboard; The Telefunken Crystal Set; Two Popular AM Loop Antennas; Diode Biasing; Ultrasound Pressure of a Weak Spark; The Old Timer - Regeneration; The Antenna Tutorial I, II & III; Crystal Radios Are Like Beer; A Trap Antenna; Simple Circuits for Quality Sound; Audio Regeneration; Powered by Fleming's Amazing Valve; Two JFET Crystal Sets, From the Mailbox of Prof Verruckt, The AM Antenna Tuner Kit, and more. 8-½ by 11 with 115 pages, Comb Bound. Cat#XV21 $16.95.

Building your First Crystal Radio by J.K. Fenton



This small booklet is written in easy to read language for the true beginner to our wonderful hobby. It has pictures and symbols for basic parts and gives the reader basic information to get started with that first building project. 5 1/2 X 8 1/2 15 pgs

Cat# XBGN $2.95.

ORDER FORM (5/2013)

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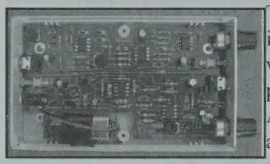
www.midnightscience.com

Grounding Kit

This kit is ideal for use with our Crystal Radio Antenna Kit or for general station grounding. It consists of a long-lasting 2.5 by 1/2 inch galvanized ground rod, 1/2-inch brass rod clamp, ten feet of #14 Insulated Stranded copper antenna wire and an instruction/installation sheet. The grounding kit provides for an outside grounding circuit for your crystal radio. The antenna wire is very flexible, allowing you to loop it under your window at the sill and then simply closing the window.

Grounding Kit Catalog # Grd-K $19.95.

CW REGEN FILTER, (Alias: The Scrubber)



This kit was inspired by the inhibiting galactic noise encountered when listening to HF CW. Many proficient CW operators turn the AF gain full on and manage the audio signal and noise with internal rig filters and the RF gain knob. Even with these techniques band-limited cosmic static is present along with some man-made noise. There isn't much one can do to copy CW notes that are simply too weak; but, one can scrub away a portion of the static that makes its way into our consciousness with an audio regenerative filter. (See the feature article on the CW Scrubber in November, 2012 CQ Magazine.)

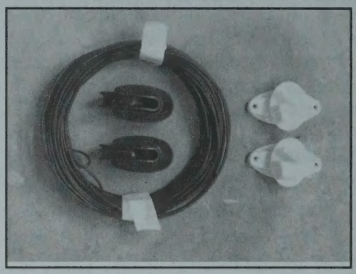
For example, when tuned to a quiet spot on 30-meters, regen's output shows a reduction in noise compared to the signal at the phone jack of the receiver. In bypass mode one simply listens to what the rig has to offer. In scrubber mode, the multiple-op-amp filters and regen work together to remove a majority of the remaining white noise. The processed signal sounds clean with a slight echo-chamber quality. For most this is an improvement, reducing stress and improving copy.

For experienced kit makers, assembly and alignment is about two hours. You can use a meter or scope to align the filters and the audio delay line. If you have neither of these you can align the filter by ear. If you don't have a signal generator, you can use CW from your rig, a code oscillator or download 600, 700, and/or 800 Hz wavefiles from our "downloads" webpage. In addition, you'll supply the connectors and cabling for your specific radio and the following tools and supplies: pliers, cutters, knife or wire stripper, soldering iron & solder, masking tape and your enthusiasm! The filter can be supplied with a well regulated and grounded +12VDC supply or 9V battery. A well grounded station is necessary when external high gain audio-based accessories are added to prevent or substantially reduce any "ground loop" interference. The populated PCB fits in a plastic case that is W 3.700, H 1.450, and L 6.100 inches.

CW REGEN FILTER KIT, PCB & MANUAL ONLY 29.95
CW REGEN FILTER KIT, NO CASE 49.95
CW REGEN FILTER KIT WITH CASE 69.95

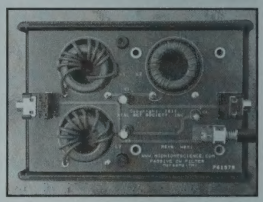
Crystal Radio Antenna Kit

This kit consists of 50 feet of #14 AWG insulated and stranded copper antenna wire, two nail insulators, two antenna insulators and an instruction and installation sheet. The instruction sheet outlines how to install the antenna for the AM band.



The nail insulators mount with two wood screws and provide for wire support near the window and at a tree or eve. Weave the wire through the "claws" of the nail insulator to hold it in place. The antenna insulators may be used with rope on one side and as a tie-off for the antenna wire on the other side. These are shown in the picture inside the 50' loop of wire. Since the wire is flexible, you can easily place it on your window sill and close the window. Crystal Radio Antenna Kit Cat #Ant-k $19.95

Passive Audio CW Filter Kit



Our Passive Audio CW Filter Kit was inspired by our enthusiasm for non-powered – no batteries or power supplies required – electronics. The kit features a 250 Hertz (Hz) bandwidth, 700 Hz center-frequency, 8-ohms in, 8-ohms out audio filter, designed for CW operation. A bypass switch allows for bypass and in-line reception comparison. The unit installs between your receiver's headphone jack and headphones or speaker. Assembly for experienced kit builders is less than an hour. The kit consists of eleven parts, including three high-mu ferrites, quality PCB and black plastic case. Instructions are included for changing the filter bandwidth to 500 Hz for CW or 1500 Hz for SSB; for either of these frequency bandwidths the number of winding per core must be changed and a different set of capacitors purchased.

The kit can accommodate other center frequencies and bandwidths. To calculate the number of turns for the cores (coils) and the capacitor values required download these files: manual addendum and filter calculator spread sheet (xls).

Passive Audio CW Filter Kit, with PCB & CASE 36.95

Xtal Set Society ◆ PO Box 3636, Lawrence KS 66046 ◆ 405-517-7347 ◆xtalset@sunflower.com
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